

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference NM5212	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/IB2002/001384	International filing date (<i>day/month/year</i>) 25.04.2002	Priority date (<i>day/month/year</i>) --
International Patent Classification (IPC) or national classification and IPC H04Q 7/38, H04M 15/00, H04M 17/00		
Applicant Nokia Corporation et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
- a. ☒ (sent to the applicant and to the International Bureau) a total of 8 sheets, as follows:
- ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
- ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
- b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:
- ☒ Box No. I Basis of the report
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 18.02.2003	Date of completion of this report 14.07.2004
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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/IB2002/001384

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1 - 14 _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☒ the claims:
- pages _____ as originally filed/furnished
- pages* _____ as amended (together with any statement) under Article 19
- pages* 1 - 8 received by this Authority on 2004.04.15
- pages* _____ received by this Authority on _____
- ☒ the drawings:
- pages 1 - 2 _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/IB2002/001384

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-38</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-38</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-38</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Documents cited in the International search report:

D1) US2001024950 A1
D2) WO0069201 A
D3) EP1065838 A
D4) US6101379 A
D5) WO9956492 A
D6) WO0045611 A
D7) US2002034298 A1

The claimed invention relates to the method and network system for charging an account related to a terminal device of a subscriber to a first data network session rendered to the terminal device when roaming in a second data network. The claimed invention solves the problem of complicated online charging of roaming network subscribers.

D1 is considered the closest prior art and relates to a method of routing Call Detail Records (CDRs) for a subscriber from a foreign network to a home network whilst the subscriber is roaming in the foreign network. D1 solves the problem of charging when it is too complicated and takes too long before the CDRs are forwarded on to the home network. D1 solves the problem by routing CDRs for a subscriber from a serving exchange (a mobile switching centre, MSC) to a billing system.

The invention according to D1 include the following steps:
-registrates the terminal device (the mobile subscriber) with the second network (the foreign network, see paragraph 0006 in D1);

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

-transmits a network address of a charging system related to said first network from the first network to the second network (a billing system address is coupled to the first network, paragraph 0008);

-establishes a network session for the terminal device by the second data network;

-assesses in the second data network first charge information about the network session (see paragraph 009);

-transmits assessed charge information from the second data network to the network address of the first charging system (it transfers info of CDRs to the billing system address, see paragraph 0010);

-calculates a charge for the network session at the first charging system using incoming first charge information (see paragraph 0037).

The cited prior art differ from the claimed invention in that it does not describe that the step of transmitting the network address of the first charging system from the first data network to said second data network is performed before the step of registering the terminal device to the second data network.

Therefore, the claimed invention is not obvious to a person skilled in the art.

Accordingly, the invention defined in claims 1-38 is novel and is considered to involve an inventive step. The invention is industrially applicable.

Berlin, 15 April 2004

Our Ref.: NM 5212-01WO OUN/LE/jwd
Direct Dial: 089/549 075 18

Applicant: NOKIA CORPORATION
Serial Number: PCT/IB2002/001384

New Claims

1. A method for charging an account related to a terminal device (1) of a subscriber (A) to a first data network (10) for a network session rendered to said terminal device when roaming in a second data network (18), comprising the steps of
 - registering said terminal device (1) to said second data network (18),
 - transmitting a network address of a first charging system (16) related to said first data network (10) from said first data network to said second data network (18)
 - establishing said network session for said terminal device (1) by said second data network (18),
 - assessing in said second data network first charge information about said network session,
 - transmitting said assessed charge information from said second data network (18) to said network address of said first charging system (16), and
 - calculating a charge for said network session at said first charging system (16) using said incoming first charge information,wherein said step of transmitting said network address of said first charging system (16) from said first data network (10) to said second

data network (18) is performed before said step of registering said terminal device (1) to said second data network (18).

2. A method according to claim 1, comprising the further steps of
 - saving said assessed first charge information about said network session to a second charging system (28) related to said second data network (18),
 - calculating a charge for said network session by second charging system (28) using said saved first charge information
 - charging said charge for said network session to a first operator of said first data network (10).
3. A method according to claim 2, in which said first charge information saved to said second charging system (28) is marked with a flag indicating that said first charge information is related to a subscriber of said first data network (10).
4. A method according to claim 2 or 3, in which said charge is charged after termination of said network session.
5. A method according to any one of the preceding claims, in which said first charge information is a bearer charge information.
6. A method according to any one of the preceding claims, in which said step of assessing a first charge information in said second data network is performed in near real-time or in real-time.
7. A method according to any one of the preceding claims, in which said step of transmitting said assessed first charge information from said second data network (18) to said network address of said first charging system (16) is performed in near real-time or in real-time.
8. A method according to any one of the preceding claims, in which charging said account is performed in near real-time or in real-time.

9. A method according to any one of the preceding claims, in which charging said account is performed online.
10. A method according to any one of the preceding claims, further comprising a step of transmitting subscriber information from said first data network (10) to said second data network (18) before said step of establishing said network session.
11. A method according to any one of the preceding claims, with the further steps of
 - assessing first-operator charge information related to said network session using said forwarded first charge information,
 - transmitting said assessed second-operator charge information to said network address of said first charging system (16),and in which calculation of charge for said network session by said first charging system is performed using in addition said incoming first-operator charge information.
12. A method according to claim 11, in which the step of assessing first-operator charge information related to said network session using said forwarded first charge information is performed in near real-time or in real-time
13. A method according to claim 11 or 12, in which the step of transmitting said assessed second-operator charge information to said network address of said first charging system (16) is performed in near real-time or in real-time.
14. A method according to any one of the preceding claims, in which said subscriber is subscribed to said first data network (10) through a second network operator, comprising the further steps of

- transmitting and saving said network address of said first charging system (16) from said first data network (10) to a server (48) related to said second operator of said first data network (10),
 - forwarding from said first data network to said server (48) said first charge information received from said second data network,
 - assessing second-operator charge information related to said network session using said forwarded first charge information,
 - transmitting said assessed second-operator charge information to said network address of said first charging system (16),
- and in which calculation of charge for said network session by said first charging system (16) is performed using in addition said incoming second-operator charge information.

15. A method according to claim 14, comprising the further step of transmitting said assessed operator charge information from said server (48) to a third charging system (50) related to said second operator.
16. A method according to claim 15, in which said operator charge is charged after termination of said session by said third charging system (48) to said first operator of said first data network (10).
17. A method according to any one of the preceding claims in which said account charged is a prepaid account.
18. A method according to any one of the preceding claims in which said steps of calculation of a charge for said network session by said first charging system (16) using said incoming first charge information and charging said account are performed in real-time.
19. A method according to any one of the preceding claims in which said network session is established between said terminal device (1) and a station (42) in a third data network (30), which station (42) is, regarding said network session, an originating or a terminating station.

20. A method according to claim 10 comprising, before said step of establishing said network session between terminal device (1) in said second data network (18) and said station (42) in said third data network (30), a further step of establishing a control network session between said terminal device (1) and said station (42), which control network session is routed through a first network control node (12) related to said first data network (10).
21. A method according to claim 11 in which said first charge information is transmitted via said control network session.
22. A method according to one of the preceding claims, in which at least one of said data networks (10, 18, 30) is a radio data network.
23. A method according to claim 14, in which said data networks (10, 18, 30) are packet switched radio data networks.
24. A network system comprising
 - a first data network (10),
 - at least one second data network (18),
 - a first-network charging system (16) related to said first data network (10), and
 - a first terminal device (1) subscribed to said first data network, wherein
 - said first data network (10) has a first-network service assessment system (12) communicating with a second-network service assessment system (22) in said second data network and adapted to transmit a network address of said first-network charging system (16) to said second-network service assessment system (22), and
 - said second-network service assessment system (22) is adapted to assess and to transmit first charge information during said network session to said first-network charging system (16) using said network address,

wherein said first-network service assessment system (12) is additionally adapted to performing said step of transmitting said network address of said first charging system (16) from said first data network (10) to said second data network (18) before a step of registering said first terminal device (1) to said second data network (18).

25. A network system according to claim 24, comprising in addition a second-network charging system (28) related to said second network (18) and communicating with said second-network service assessment system (22), in which said second-network service assessment system is additionally adapted to transmit said first charge information about said network session to said second-network charging system (28).
26. A network system according to claim 24 or 25, comprising a second-network session control system (20, 22, 24) adapted to establish and maintain a network session between the first network station (1) and a terminating or an originating second network station (42).
27. A network system according to any one of the claims 24 to 26, in which, to perform said transmission of said first charge information from said second-network service assessment system (22) to said first-network charging system (16), said second-network session control system (20, 22, 24) is additionally adapted to transmit said first charge information to said first-network session control system (12), and said first-network control system (12) is additionally adapted to transmit said received first charge information to said first-network charging system (16).
28. A network system according to any one of the claims 24 to 27, in which the first-network charging system (16) is adapted to transforming balance information related to the first network station (1), the transformation depending on the balance information and on the incoming first charge information related to said first network station

29. A network system according to claim 28, in which the first-network charging system (16) is adapted to perform said transformation in near real-time or real-time.
30. A network system according to any one of the claims 24 to 29, in which said second-network service assessment system (22) is adapted to assess and to transmit in near real-time or real-time said first charge information during said network session to said first-network charging system (16) using said network address.
31. A network system according to any one of the claims 24 to 30, in which said first charge information is a bearer charger information.
32. A network system according to one of the claims 24 to 26, in which said first-network session control system (12) is additionally adapted to assess during said network session and to transmit to said first-network charging system (16) first-operator charge information depending on said received charge information, and in which said first-network charging system (16) is adapted to transform said balance information in additional dependence of said incoming first-operator charge information.
33. A network system according to one of the claims 24 through 32, which additionally comprises a second-operator server (48) which is related to said first data network (10) and communicates with said first-network call session control system (12), and which is adapted to assess second-operator charge information related to said network session using said first charge information and to transmit said second-operator charge information to said first-network charging system (16), and in which said first-network charging system (16) is adapted to transform said balance information in additional dependence of said incoming second-operator charge information.

34. A network system according to claim 33, comprising in addition a second-operator charge system (50) related to said first data network (10) and communicating with said second-operator server (48), in which said second-operator server (48) is additionally adapted to transmit second-operator charge information about said network session to said second-network charge system (50).
35. A network system according to any one of the claims 24 to 34 in which the first charging system (16) is adapted to apply a real-time transformation algorithm to said types of incoming charge information.
36. A network system according to any one of the preceding claims, in which said first and second networks (10, 18) are GPRS Public Land Mobile Networks.
37. A network system according to claim 36, in which said second-network session control system comprises a serving GPRS support node (SGSN) (22), a GPRS Internet Protocol backbone (20), and a Gateway GPRS support node (GGSN) (24).
38. A network system according to claim 37 in which said second-network service assessment system (22) is integrated into said SGSN (22).